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Analysis of Student Perceptions of the Use of Artificial Intelligence in Learning in the Digital Age

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Abstract: This study examines students' perceptions of the positive and negative impacts of using Artificial Intelligence (AI) in learning in the digital era. In the digital era, AI is growing rapidly and its potential is expanding in education. Understanding students' perceptions is key to implementing AI effectively and optimally. This study used a qualitative method with a descriptive approach and involved 114 students at two universities in Lampung. Data was collected through an online questionnaire. The results show that most students have a positive perception of the impact of AI in learning. AI helps them focus on learning, understand the material more easily, complete tasks faster, and make learning more interesting. However, some students also have concerns about the negative impacts of AI, such as laziness in learning, dependence on technology, and potential misuse of AI. This study concludes that AI has great potential to improve the quality of student learning. It should be understood that AI cannot replace the role of lecturers, but it can assist lecturers and students in the learning process. It is important to use AI carefully and balance it with conventional learning. The results of this research are expected to contribute to various parties in achieving better educational goals.

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INTRODUCTION

The digital era has revolutionized many aspects of life, including education. The rapid development of Artificial Intelligence (AI) technology presents transformative opportunities to improve the quality and efficiency of the teaching and learning process. AI offers various potentials, ranging from personalizing learning, providing faster and more accurate feedback, to supporting students to learn independently.

According to McKinsey Global Institute, AI is predicted to contribute $13.7 trillion to the global economy by 2025. In education, AI is projected to have a significant impact, with the potential to improve student learning outcomes by up to 15%. In Indonesia, the application of AI in education is starting to gain attention. The Ministry of Education and Culture has launched various programs and initiatives to encourage the use of AI in schools and universities. One example is the "Guru Penggerak" program that integrates AI in the learning process. Students as the younger generation who are familiar with technology have an important role in understanding and utilizing AI in their learning process. Their perception of the positive and negative impacts of using AI in learning is key to ensuring effective and optimal AI implementation.

This study aims to analyze students' perceptions of the positive and negative impacts of using AI in learning in the digital era. By understanding these perceptions, we can formulate appropriate

strategies to implement AI in effective and efficient learning, as well as develop AI-based learning systems that suit students' needs and preferences.

The results of this research are expected to contribute to various parties, including educators, developers of AI-based learning systems, students, and the wider community. Educators can design more effective and efficient learning by utilizing AI optimally. Developers of AI-based learning systems can create user-friendly systems that suit the needs of students. Students can utilize AI to improve their learning outcomes and understand its potential and risks. The wider community can obtain information about the benefits and potential of AI in education.

Some previous studies on AI in education include a study entitled The Use of a Web-Based Intelligent Tutor System to Improve Mathematics Learning Outcomes in Elementary School Students by Mustari et al. (2018). The results showed that the use of a web-based intelligent tutor system can significantly improve the math learning outcomes of elementary school students. The second research is a study entitled "Application of Artificial Intelligence-Based Chatbot to Improve English Language Skills in Students" by Lestari et al. (2021). This research shows that AI chatbots can help students improve their English speaking, listening, reading, and writing skills. The third research with the title "Implementation of Artificial Intelligence (AI) in the Field of Vocational Education in the Era of the Industrial Revolution 4.0" by Jatmiko (2022). This research shows that AI can be applied in the field of vocational education to improve the quality of learning, assist with assessment, and facilitate independent learning.

This research differs from previous research in several ways, among others: This research does not focus on just one aspect of AI in education, such as tutoring systems or chatbots, but analyzes students' perceptions of the positive and negative impacts of AI as a whole. This research considers the context of the digital era, where AI is developing rapidly and its potential is expanding in education. This research takes student perceptions as the main focus to understand how AI can be implemented effectively and optimally. Ultimately, this research is expected to improve the quality of education in the digital era and provide benefits for various parties in achieving better educational goals.

METHODS

This research uses a qualitative research type with a descriptive approach. The descriptive approach was chosen to describe and analyze students' perceptions of the positive and negative impacts of using AI in learning in the digital era. The subjects in this study were active students in two universities who have used or recognized AI in the learning process, namely students of UIN Raden Intan Lampung and students of Bakti Nusantara Institute Lampung. The sampling technique used random sampling. The number of samples was determined by the number of respondents who filled out the online questionnaire link that had been distributed, namely 114 respondents. The data collection technique used in this research is using an online questionnaire. The questionnaire was distributed to students via Google Form. The questionnaire contains questions about students' experience in using AI in learning, students' perceptions of the positive impact of using AI in learning and students' perceptions of the negative impact of using AI in learning. The research instrument used in this study was an online questionnaire. The online questionnaire was prepared using Google Form. The questionnaire that has been made is tested for validity and reliability using SPSS version 26.0 software. The data obtained from the online questionnaire was analyzed using qualitative data analysis techniques, namely descriptive analysis**.** Online questionnaire data were analyzed using descriptive statistics to determine the frequency and distribution of student answers.

RESULTS AND DISCUSSION

Independent Variable

The independent variables in this study are divided into two categories: the positive impact of AI on learning motivation and the negative impact of AI on learning motivation.

AI Positive Impact Variable

x1 : The use of AI helps focus on learning
x2 : The use of AI helps to understand the lecture material more easily
x3 : The use of AI helps to complete coursework more quickly and efficiently
x4 : Using AI makes learning more interesting and fun
x5 : Using AI increases confidence in learning

AI Negative Impact Variable

y1 : The use of AI makes me lazy to study and doubt my own ability
y2 : The use of AI has made us dependent on technology and unable to use it self-study

Dependent Variable

The dependent variable in this study is student learning motivation, to measure student learning motivation by using the average value of the positive impact of AI minus the average value of the negative impact of AI. Learning motivation is calculated by the formula:

Learning Motivation = (Average Positive Impact of AI) - (Average Negative Impact of AI)

$$\textit{Average Positive Impact of AI} = \frac{x1+x2+x3+x4+x5}{5}$$

$$\textit{Average Negative Impact of AI} = \frac{y1+y2}{2}$$

Interpretation of Learning Motivation Score:

Learning Motivation Score > 0: AI has a greater positive impact than its negative impact in increasing learning motivation.

Learning Motivation Score <0: AI has a greater negative impact than its positive impact in increasing learning motivation.

Learning Motivation Score = 0: The positive and negative impacts of AI on learning motivation are equal.

Validity and Reliability

Whether a research instrument is good or not is determined by its validity and reliability. Instrument validity concerns the extent to which measurements are precise in measuring what is to be measured, while reliability concerns the extent to which a measurement can be trusted because of its constancy. The instrument is said to be valid when it can reveal data from the variable accurately and not deviate from the actual situation. The instrument is said to be reliable when it can reveal reliable data (Arikunto, 2010).

The validity and reliability of the instrument are not necessarily determined by the instrument itself. According to Sugiyono (2014), factors that affect the validity and reliability of a measuring instrument (instrument) other than the instrument are the user of the measuring instrument who takes the measurement and the subject being measured. However, these factors can be overcome by testing the instrument with the appropriate validity and reliability tests. Testing is done to maintain validity and reliability. In addition, to overcome the influence of the measuring instrument user, the user must improve his ability to use the measuring instrument. One more factor that is no less important that affects the validity and reliability of the instrument is the factor of the subject being measured. To overcome this, the researcher must be able to control the subject.

Although an instrument has been standardized and reliable, it does not immediately make the instrument can be used anywhere, anytime, to any subject. The instrument needs to be retested each time it will be used (Tavakol & Dennick, 2011).

The researcher presents the data processed from the research results in the form of tables which include data on respondents' assessments of the Positive Impact of AI variables and the Negative Impact of AI variables with a sample of respondents, namely students of UIN Raden Intan Lampung and Institut Bakti Nusantara Pringsewu. Valid and reliable instruments are needed to obtain reliable research results. Valid means that the instrument can be used to measure whatever should be measured. Reliable means that if the instrument is used several times to measure the same object, it will produce the same data. Validity and reliability tests need to be carried out on the measuring instruments to be used in research. The results of testing the validity and reliability of the indicators in this study using the SPSS Statistics 26.0 computer program. The following is a test of the validity and reliability of the indicators of the variables in the study to be tested:

AI Positive Impact Variable Validity Test Results

Correlations

		x1	x2	x3	x4	x5	Total X
x1	Pearson Correlation	1	.315**	.236*	.293**	.308**	.622**
	Sig. (2-tailed)		.001	.011	.002	.001	.000
	N	114	114	114	114	114	114
x2	Pearson Correlation	.315**	1	.347**	.426**	.179	.680**
	Sig. (2-tailed)	.001		.000	.000	.056	.000
	N	114	114	114	114	114	114
x3	Pearson Correlation	.236*	.347**	1	.215*	.395**	.651**
	Sig. (2-tailed)	.011	.000		.021	.000	.000
	N	114	114	114	114	114	114
x4	Pearson Correlation	.293**	.426**	.215*	1	.272**	.682**
	Sig. (2-tailed)	.002	.000	.021		.003	.000
	N	114	114	114	114	114	114
x5	Pearson Correlation	.308**	.179	.395**	.272**	1	.673**
	Sig. (2-tailed)	.001	.056	.000	.003		.000
	N	114	114	114	114	114	114
Total X	Pearson Correlation	.622**	.680**	.651**	.682**	.673**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	114	114	114	114	114	114

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Based on the table above, all independent variables have a high Pearson correlation coefficient (more than 0.6) with the dependent variable. This indicates that all the independent variables have a strong relationship with the total X. In addition, all p values are less than 0.05, which indicates that all relationships between the independent variables and the dependent variable are statistically significant.

Based on the analysis of the Pearson correlation coefficient and p value, it can be concluded that all independent variables (x1, x2, x3, x4, x5) have good validity to predict the dependent variable (total X).

Validity Test Results of AI Negative Impact Variables

Correlations

		y1	y2	Total Y
y1	Pearson Correlation	1	.606**	.899**
	Sig. (2-tailed)		.000	.000
	N	114	114	114
y2	Pearson Correlation	.606**	1	.893**
	Sig. (2-tailed)	.000		.000
	N	114	114	114
Total Y	Pearson Correlation	.899**	.893**	1
	Sig. (2-tailed)	.000	.000	
	N	114	114	114

**. Correlation is significant at the 0.01 level (2-tailed).

Based on the table above, all independent variables have high Pearson correlation coefficients (more than 0.8) with the dependent variable. This indicates that all independent variables have a strong relationship with the total Y. In addition, all p values are less than 0.05, which indicates that all relationships between the independent variables and the dependent variable are statistically significant.

Based on the Pearson correlation coefficient analysis and the p value, it can be concluded that all independent variables (y1, y2) have good validity to predict the dependent variable (total Y).

AI Positive Impact Variable Reliability Test Results

Reliability Statistics

Cronbach's Alpha	N of Items
.677	5

Based on the Cronbach's Alpha value of 0.677, it can be concluded that variables x1, x2, x3, x4, and x5 have **sufficient** reliability.

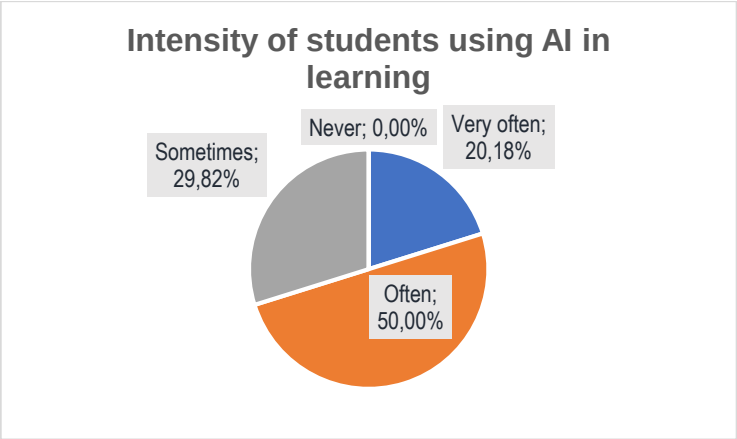
Reliability Test Results of AI Negative Impact Variables

Reliability Statistics

Cronbach's Alpha	N of Items
.754	2

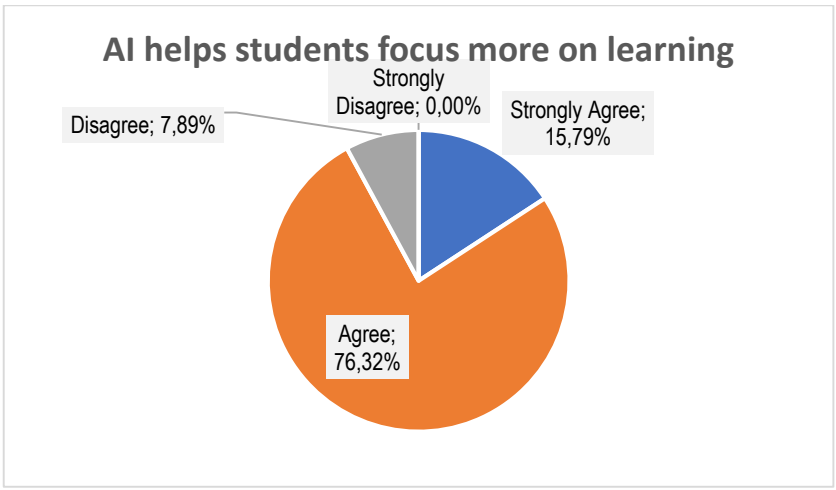
Based on the Cronbach's Alpha value of 0.754, it can be concluded that variables x1 and x2 have good reliability**.**

Intensity of AI Use in Learning

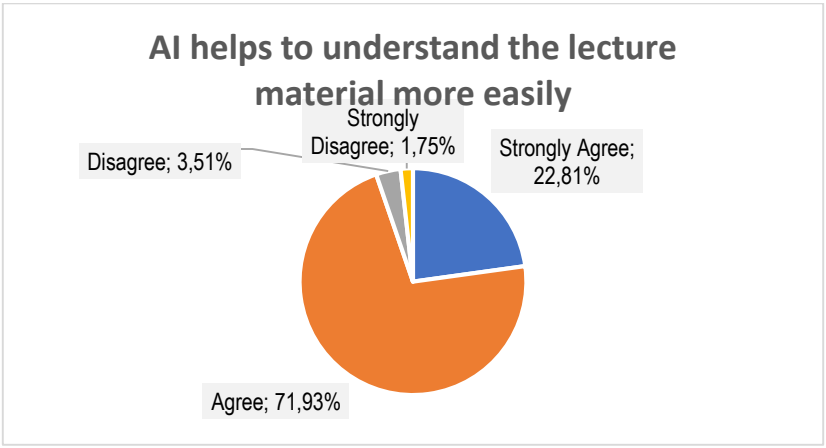


Most students (70.18%) use AI in their learning, with 50.00% using it frequently and 20.18% using it very frequently. This shows that AI has become a common tool used by students in their learning process. Only a small proportion of students (29.82%) use AI sometimes, and there are no students who never use it. This shows that AI is well accepted by students and they see it as a useful tool for learning.

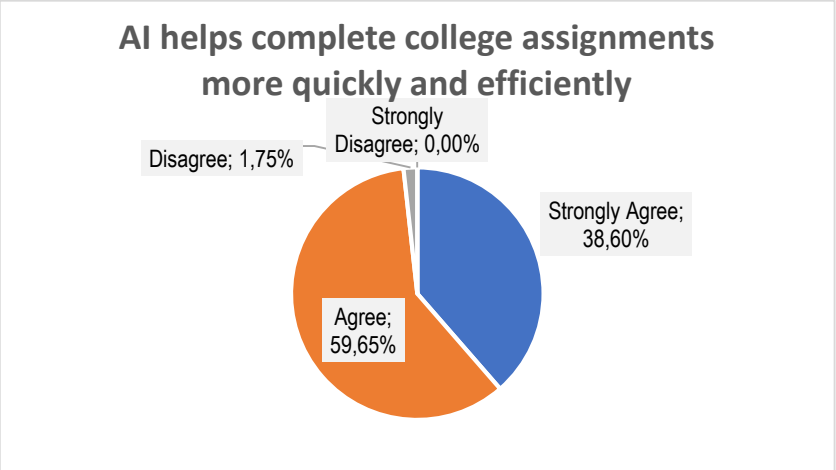
Positive Impact of AI on Learning



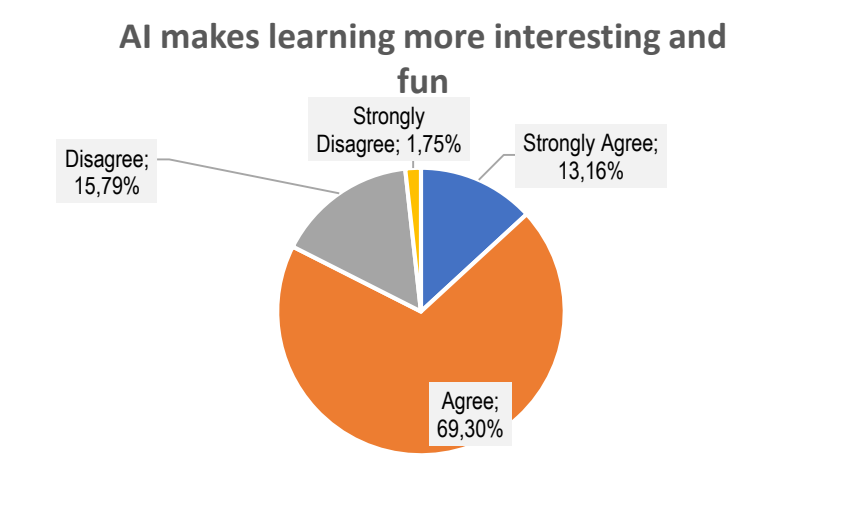
The majority of students (92.11%) agreed or strongly agreed that AI helps them focus on learning. This suggests that AI can help students to concentrate on the learning material and reduce distractions.



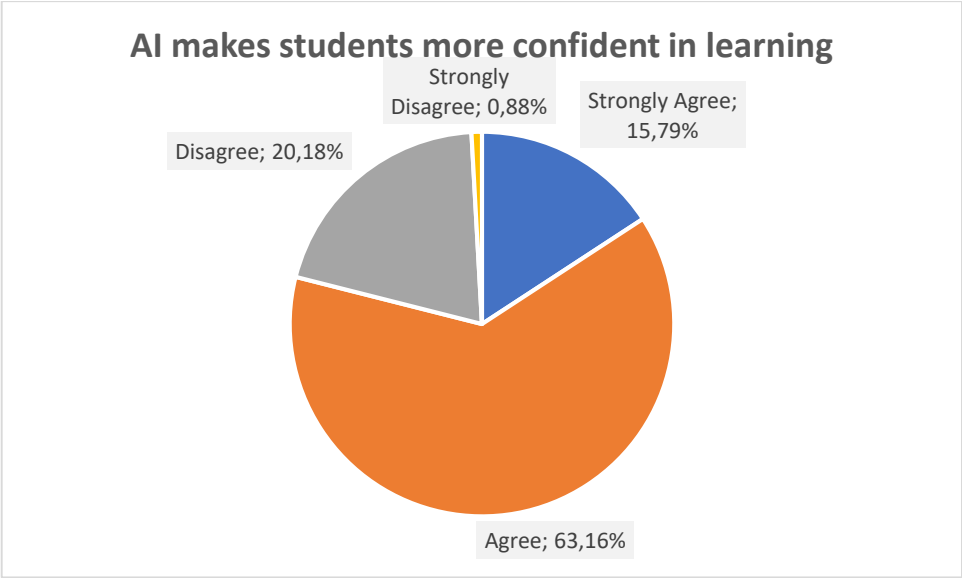
Almost all students (94.74%) agreed or strongly agreed that AI helped them understand the course material more easily. This shows that AI can help students to learn more effectively and efficiently.



98.25% of students agreed or strongly agreed that AI helped them complete their coursework more quickly and efficiently. This shows that AI can save students time and effort in completing assignments.

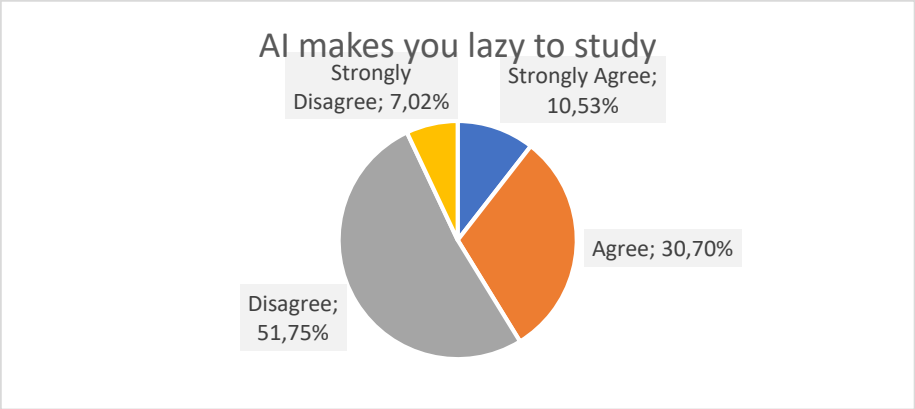


82.46% of students agreed or strongly agreed that AI makes learning more interesting and fun. This shows that AI can increase students' motivation and engagement in learning.

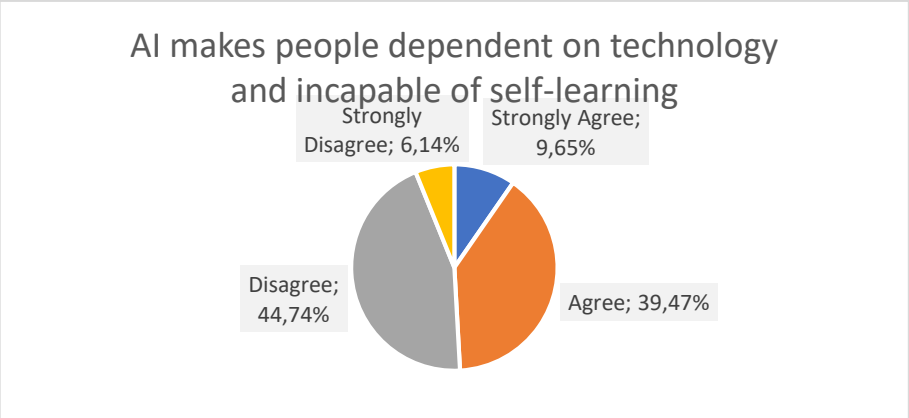


About 78.95% of students agreed or strongly agreed that AI made them more confident in learning, suggesting that AI can help improve students' self-efficacy in the learning process.

Concerns about AI in Learning

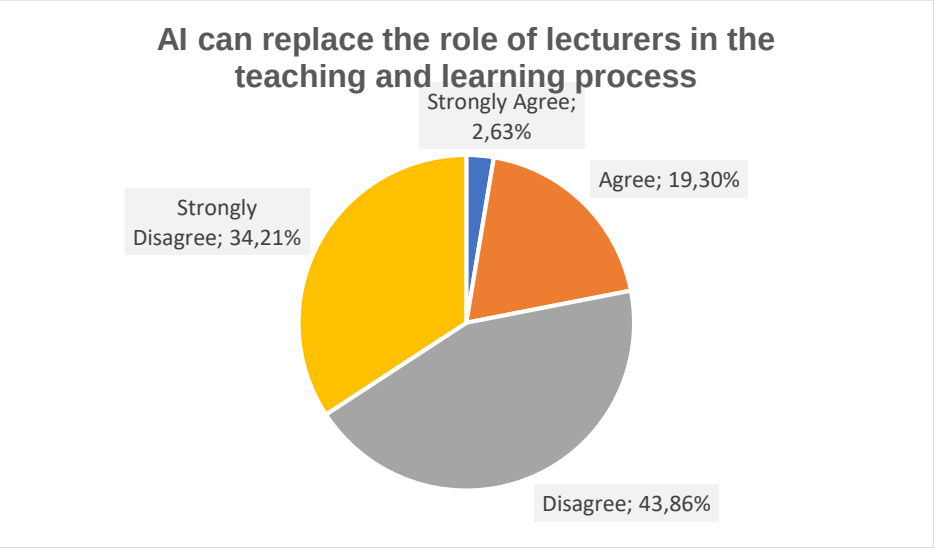


Despite the many benefits, some students (41.23%) agreed or strongly agreed that AI can make them lazy to study. This suggests that AI needs to be used with caution to avoid negative effects on learning motivation.



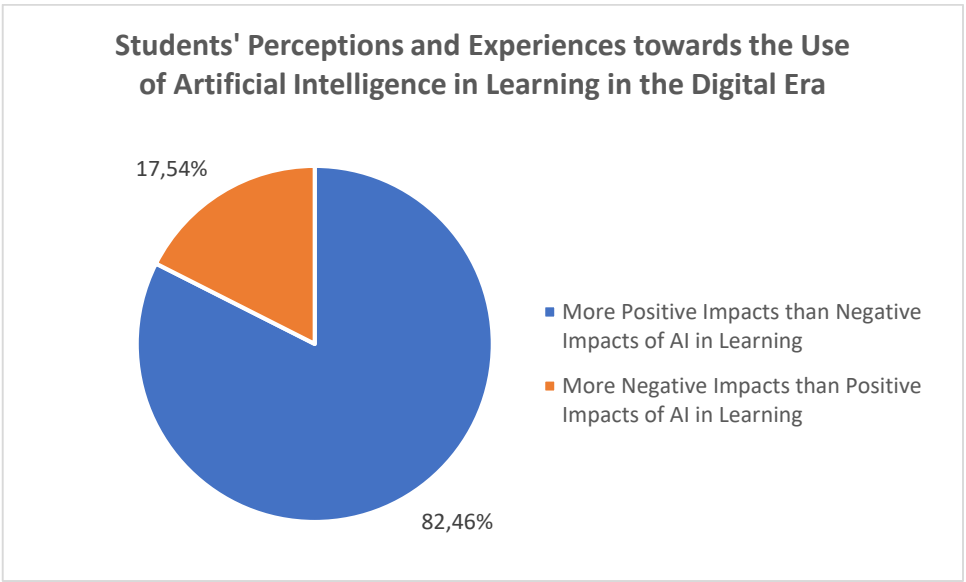
Almost half of the students (49.11%) agreed or strongly agreed that AI can make them dependent on technology and unable to learn independently. This suggests that it is important to balance the use of AI with traditional learning that encourages independent learning.

The Role of Lecturers in the Digital Age and the Onslaught of AI



Most students (78.07%) disagreed or strongly disagreed that AI can replace the role of lecturers in the teaching and learning process. This shows that students appreciate the role of lecturers in guiding, facilitating, and providing direction and motivation in the learning process.

Student Perceptions of the Use of Artificial Intelligence in Learning in the Digital Age



Based on the research data, most students (82.46%) have a positive perception of the impact of AI in learning. This shows that they believe that AI has the potential to bring more benefits than disadvantages in the teaching and learning process. Some of the reasons underlying this positive perception are:

1. AI can help automate repetitive tasks and allow lecturers to focus on more personalized interactions with students.
2. AI can be used to tailor learning materials and teaching methods to the needs and learning styles of individual students.
3. AI can help students with special learning needs to access the materials and support they need.
4. AI can provide access to wider and more diverse learning resources, such as interactive videos, simulations, and game-based learning.

On the other hand, 17.54% of students have a negative perception of the impact of AI in learning. Their main concerns were:

1. Concerns that AI will replace important human interaction in the teaching and learning process.
2. Concerns that AI will make it easier for students to cheat and plagiarize assignments.
3. Concerns that students who do not have access to AI technology will be left behind in learning.
4. Concerns about potential misuse of AI in learning, such as algorithm bias and data privacy violations.

CONCLUSION

AI has great potential to improve the quality of student learning. AI can help students focus on learning, understand material more easily, complete tasks faster, and make learning more interesting. However, it is important to use AI carefully to avoid negative effects such as laziness in learning, dependence on technology, and addiction. Lecturers still play an important role in the teaching and learning process and AI cannot replace their role.

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